

Subject Index

A
ADP glucose pyrophosphorylase
(ADPGPP) in starch biosynthesis,
26-27

Agriculture and weed control in
developing countries, 140-150

Agrobacterium tumefaciens, 52, 63, 65, 67

Agronomy, 100-101, 108, 110, 140-150

Agrotis ipsilon, 169

Alpha-amylase in starch degradation, 93

Amino acid composition, improving, 4

Amylopectin, 26

Amylose, 26

Antibodies

engineering of, in plants, 74-79

fragments, 74

bulk production of, 77

full-length, 75

production of, in plants, 72-79

multimeric, 76

recombinant, 76

secretory, in plants, 72

Antigen binding, 73

Antigen recognition, 73

Antimicrobial defenses, preformed,
126-135

Antioxidants, carotenoids as, 18

Antisense technology, 4

Antisense transcripts in plant cytoplasm,
60

Aquaporin in water-stressed plants, 119

Arabidopsis, 15, 16, 122

salt-stressed, inositol biosynthesis in,
122

Aspergillus niger, 95

Avenacin as antifungal agent, 127

Avirions, 43

B-cell epitope, 46

Bacillus thuringiensis, 106-113, 155, 164

Barley, fructans in, 20

Beta-1,3-glucanase, 130

Beta-carotene in vascular disease, 13

Beta-glucosidase, 66

Beta-keto acyl-CoA synthase (KCS), 85

Biochemical mechanisms in tolerance
acquisition, 115

Biofungicides, 155, 157-158

Bioinsecticides through biotechnology,
160-162

Biopesticides, development and
commercialization of, 154-162

Biopharmaceuticals, plant-based, potential
of, 68

Biotechnology

environmental impact from, 99-103

improved bioinsecticides through,
160-162

Black cutworm, 169

Broad beans, loss of, from broomrape in
Egypt, 145

Broomrapes, 142, 145

Bt transgenes, 109

Bulb-forming plants, fructans in, 20

C
Caffeic acid *O*-methyltransferase, 134

Cancer and carotenoids, 13

Canola oil, 1

high starch, 33-35

Capsid protein, 43

Carbohydrates, 20-25

Carotenoids

and chlorophyll in photosynthesis, 13

as micronutrients, 13

biosynthesis of, 14-18, 60

in transgenic plants, 13-19

cDNA, cloned, 43

Chain length, 5

Chicory, fructans in, 20

Chitinases, 130, 132-133

Cholera toxin subunits, expression of, in
plants, 50-55

Cinnamate 4-hydroxylase, 127

Cinnamyl alcohol dehydrogenase, 134

Coat proteins, 43, 174

Coconut, LPAAT in, 84

Commercialization strategies, 174

Confectionery coatings, 8

Confectionery fats, 7

Consumer appeal, 10

Corn borer, European (ECB), 164

Corn, yield losses of, from witchweed in
Kenya, 144-145

Cotton, insect resistance and, 106

Cowpea mosaic comovirus (CPMV), 43,
47-48

CPMV. *See* Cowpea mosaic comovirus
CryIA(b), 165

D
Dairy products, simulated, 8

Delta-endotoxins, expression of, in plants,
165

Desaturation of fatty acids, 5, 6

Diabrotica undecimpunctata, 169

Diabrotica virgifera, 169

Dietary fiber, 21
Diterpene cyclase, 129

Ecology, plant, 102-103

Egypt, broomrape in, 145
Engineering, genetic, in plants, 1-10
Environment, plant biotechnology and, 99-103

Enzymes

alpha-amylase in starch degradation, 93
cinnamate 4-hydroxylase, 127
diterpene cyclase, 129
human, in transgenic tobacco, bioproduction of, 62-69
in industrial use, 91-97
in starch biosynthesis, 26-27
phenylalanine ammonia-lyase, 127
phytase, extracellular expression of, 94-95, 96
seed-formulated, 93
sesquiterpene cyclase, 129

Epitopes that induce immunity, 43

Escherichia coli, 27, 29, 33, 43

Fatty acids, saturated, 34

Fatty alcohols in seed oil, 87

Field testing of recombinant plant viruses, 58-60

Flavr Savr tomato, 4

Food quality, improving, 1-10

Foot and mouth disease, 47

Fructans, 20-25

bacterial, in plants, 23-24
biosynthesis of, 20, 22-23
digestion of, 21

Gamma-carboxylation, 64-65

Gaucher's disease, glucocerebrosidase (hGC) in, 69

Genes

alpha-trichosanthin, 58
coat protein genes, 174
cryIA(b), 112
glgC16, 33, 34
Psy 1, 16-17
thioesterase, 9

Genetic engineering, 1-10, 37-41, 57-60, 82-88, 91-97, 106-113, 115-123, 170

Geranylgeranyl pyrophosphate (GGPP), 15

Gibberelins, 17

Glucocerebrosidase, human, tobacco-based production of, 66-67, 68

Glycoproteins, hydroxyproline-rich (HRGPs), 133-135

Glycosylation, 65, 68, 74, 93

Green revolution, impact of, 141

HEAR oil, 84, 86-88

Herbicide-resistant crops in developing countries, 140-150

Herbicide-resistant soybeans, 172

Herbicides in developing countries, 141

Heterorhabditis bacteriophora, 159

Hybrid viral vector, 57

Hypersensitive response (HR), 126

Imidazolinone in parasite control, 143

Immunity

cholera toxin (ctx) in, 50

induction of, by viruses, 43-47

Immunization, passive, with monoclonal SigA, 78

Immunoglobulin A, secretory, 76

Immunotherapy

antibodies in, 77-79

topical, 78-79

In planta conversion of substrate, 92

India, wheat problems in, 149-150

Industry, enzymes in, 91-97

Infectious RNA transcripts, 58

Inositol 1-phosphate synthase, 121

Inositol biosynthesis, 121

Inositol O-methyltransferase, 121

Insect resistance, transgenic plants and, 106-113

Insect-tolerant transgenic crops, 170

Insecticidal crystal proteins (ICPs), 160

Insecticidal nematodes, 159

Inulin type fructans, 20

Inulins, 20

Isoleucine in host-plant resistance in cotton, 107

Isoprenoid biosynthetic pathway, 57

Jerusalem artichokes, fructans in, 20

Johnsongrass mosaic potyvirus (JMV), 43, 47

Kenya, witchweed in, 144-145

Ketoacyl synthases, 6

Laurate, 8, 83-84

Lauric-rich oils, 8

Laurical, 8

Levans, 20
 Levansucrase, 23
 Lignin, 134
 Lycopene, 15, 17-18
 Lys-rich proteins, 39
 Lysophosphatidic acid acyltransferase (LPAAT), 83-86

M
 Mabinlin, 39-41
 Maize, transgenic, to control maize insect pests, 164-170
 Mannitol 1-phosphate dehydrogenase, 119
 Margarine, 7, 8
Mesembryanthemum crystallinum, salt tolerance in, 120-121
 Met-rich proteins, genes that encode, 38
 Methionine in transgenic seeds, 37-39
 Micronutrients, carotenoids as, 13
 Mutagenesis, 43

N
 N-linked glycans, 65
 Na⁺/H⁺ antiporter proteins, 120
 Natural defense responses, improved, 126
Nicotiana tabacum, 45, 52, 76
 Nutrient dense foods, 18
 Nutrition, 10
 carotenoids in, 13

O
 Oils, 1, 4, 5, 10, 82-88
 Oilseed rape, 33
 Onions, fructans in, 20
 Oral immunity, 50
 Osmotic adjustment in salinity stress, 117
Ostrinia nubilalis, 164

P
 Parasite control in developing countries, 143
 Pest control, 154-162
 Pests
 black cutworm, 169
 broomrape in Egypt, 145
 corn borer, European (ECB), transgenic maize to control, 164-170
 witchweed, 142, 144-145
 PG. See Polygalacturonase
 Pharmaceuticals, human, 63
 Phenylalanine ammonia-lyase (PAL) in tobacco plants, 127
 Pheromones, 158-159
 Photoinhibition and salinity stress, 116
 Photooxidation, carotenoids in protecting against, 13

Phytase
 extracellular expression of, 94-95
 industrial application of, 96
 seed-specific expression of, 95
 Phytoalexins
 genetic engineering of, 119-130
 in disease resistance, 126-130
 isoflavonoid, increasing toxicity of, 128
 Phytoanticipins, 126
 Phytoene, 15, 18
 Phytoene synthase, 17
 Phytoremediation, 102-103
 Pigments, carotenoids as, 13
 Plant Variety Protection laws, 173
 Plant virus capsid protein, 43
 Plant viruses for delivery of vaccine epitopes, 43-48
 Plants
 antibody production and engineering in, 72-79
 cholera toxin (ctx) subunits in, 50-55
 ecology, 102-103
 genetic engineering in, 1-10, 37-41, 91-97, 99-103
 transgenic
 carotenoids in, 13-19
 environmental benefits of, 100-102
 fructans in, 23
 risk assessment of, 99-103
 virally transfected, 57
 Plasmids, recombinant, 51
 Plasmodium falciparum, 48
 Plus sense RNA virus, 58
 Poliovirus epitope, 43
 Polygalacturonase (PG) in pectin degradation, 4
 Polyunsaturates, 9
 Potassium channels in salt uptake in plants, 120
 Potato
 fructans in, 23
 high starch, 28
 starch or carbohydrates in, modification of, 4
 transgenic
 mabinlin in, 41
 starch biosynthesis in, 26-27
 Potyvirus (JMV) for delivery of vaccine epitopes, 47-48
 Prenyltransferase, 128
 Promoter gene, 35, 65
 Proteins
 antifungal, 101
 beta-glucanase, 130, 132-133
 C, human (hPC), 64-66, 68
 chitinase, 132-133
 cholera toxin (ctx) in immunity, 50
 crystal, insecticidal, engineering of, 162

dietary, improved, 37-41
 industrial, 91-97
 insecticidal, 161, 165
 Lys-rich, 39
 mabinlin, 40
 Na⁺/H⁺ antiporter proteins, 120
 pathogenesis-related, in disease resistance, 130
 pharmaceutical, 63
 production of, in plants, 91-97
 seed (mabinlin), 40
 sulfur-rich, 38
 Vips, 169

Psy 1, 16-17

Race-specific resistance genes from plants, 126

Radical oxygen scavenging in salinity-stressed plants, 116

Rapeseed, 10, 82-88

Recombinant antibodies, 79

Rhinovirus, human, 47

Roundup herbicide, 173

Roundup Ready soybeans, 173

Russet Burbank potato, starch biosynthesis in, 26-27

Salt stress responses, 115

Salt tolerance, 116-120

engineering and gene transfer, 115-123

Salt uptake in plants, 120

Saturated fatty acids, 34

Secretory immunoglobulin A (SigA), 76

Seed dispersal, 13

Seed oil, genetic engineering of, 82

Seed protein (mabinlin), 40

Seed-specific expression of antisense gene, 10

Seeds

plant, industrial enzymes in, 92-97

transgenic commercialization of, 172-176

transgenic, methionine in, 37-39

Semiochemicals, 158-159

Sesquiterpene cyclase, 129

Sesquiterpenoid aldehydes, 107

Shistosoma japonica, 48

Short chain fatty acids, fructan production of, 21

Soluble solids in tomatoes, 5

Sorghum in parasite control, 143

Soybeans, herbicide-resistant, 172

Squash, virus-resistant, 174-175

Starch, biosynthesis of, 26-35

Starch-degrading enzymes, 93

Steinernema carpocapsae, 159

Steroids, 17

Stilbene synthase, 129

Stomatal conductance, altered, in salinity stress, 116

Streptococcus mutans, IgG monoclonal antibody against, 78

Subunit vaccines, 50-55

Sucrose, 20

Sulfur-rich proteins, 38

Sweet proteins, 39-41

Synthases

acetolactate (ALS), in parasite control, 143

enol-pyruvate-shikimate-phosphate (EPSP), 143

ketoacyl, 6

TAG. See Triacylglycerol

Thioesterase, 6, 9

in oil synthesis, 83

Third world needs, herbicide-resistant crops for, 140-150

TMV. See Tobacco mosaic virus

TNA viral vectors, autonomous, 57-60

Tobacco budworm, Bt-resistant, 109

Tobacco mosaic virus (TMV), 57-60

for delivery of vaccine epitopes, 44-46

Tobacco mosaic virus-based vectors, 58-60

Tobacco, transgenic

alpha-amylase in, 93-94

cholera toxin in, 52-55

human enzymes in, 62-69

Tobamoviruses, 57

TOM5, 16

Tomato

carotenoid biosynthesis in, 16

Flavr Savr, 4

high solids, 31-33

Transfection of tobacco plants, 57-60

Transgenic maize to control corn borer and other pests, 164-170

Transgenic plants, 72-79

environmental benefits of, 100-102

industrial proteins in, 91-97

insect resistance and, 106-113

risk assessments of, 99-100

Transgenic seed products,

commercialization of, 172-176

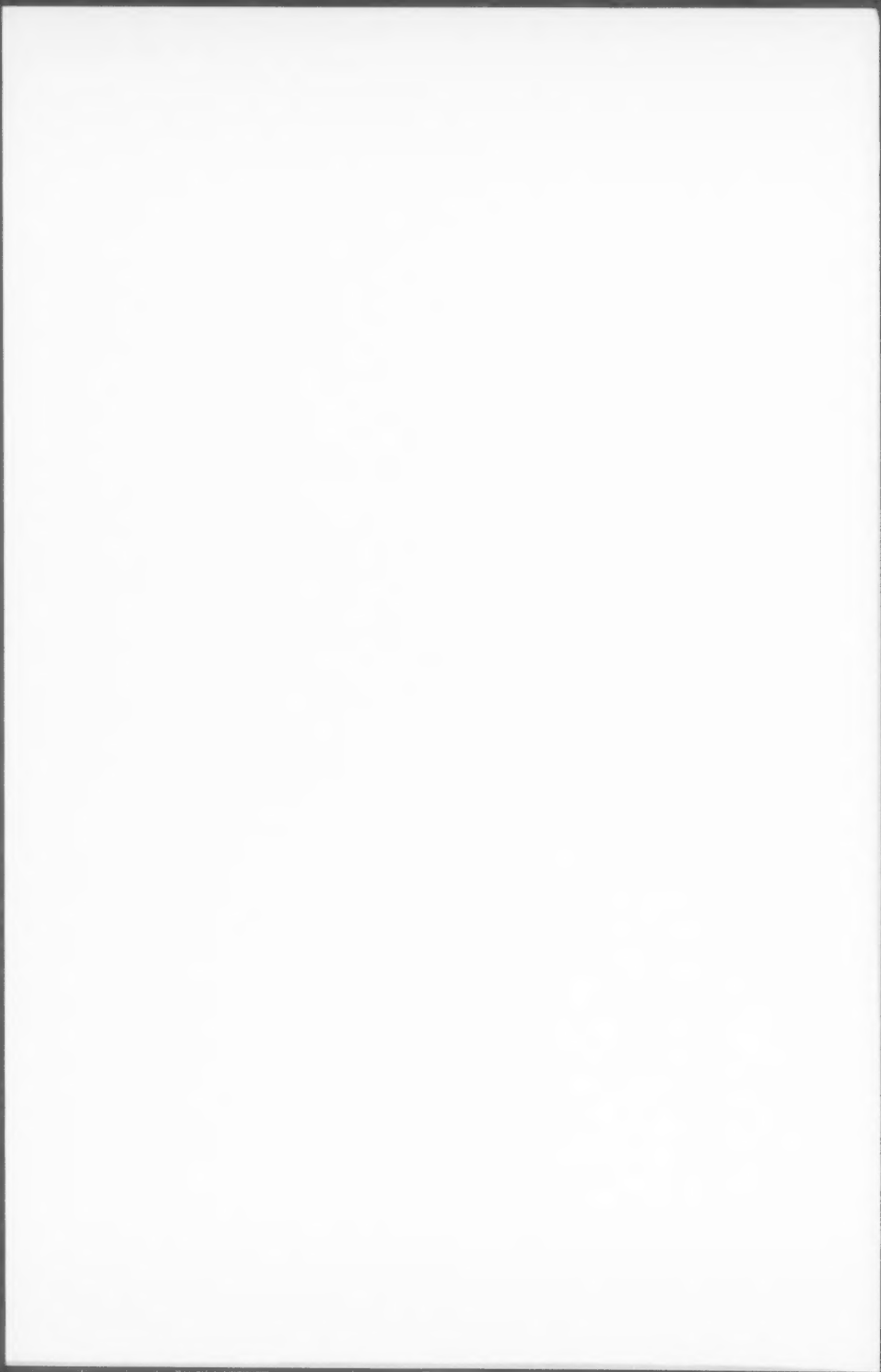
Triacylglycerols (TAGs), 8, 82

in plant storage oil, 5

Triglycerides, structured, 9

Tulips, fructans in, 20

- V**
Vaccine epitopes, delivery of, by plant viruses, 43-48
Vaccines, subunit, 50-55
Vegetative insecticidal proteins (VIPs), 169
Very long chain fatty acids, 84
Vip3, 169
Viral diseases, 173
Viral vectors, autonomous RNA, 57-60
Viruses
 cowpea mosaic comovirus (CPMV), 43
 foot and mouth disease, 47
 plant, for vaccine epitope delivery, 43-48
 plus sense RNA virus, 58
 potyvirus (JMV) for delivery of vaccine epitopes, 47-48
 replicating, 43
 tobacco mosaic virus, 44-46, 57-60
 watermelon mosaic virus II (WMVII), 174
 zucchini yellow mosaic virus (ZYMV), 174
- W**
Water uptake, plant, in salinity stress, 116-117
Watermelon mosaic virus II (WMVII), 174
Wax esters, linear, 85
Wax, long chain, in HEAR oil, 86-88
Weed control in developing countries, 140-150
Wheat
 fructans in, 20
 problems in, in India, 148-150
Witchweed, 142, 144-145
WMVII. *See* Watermelon mosaic virus II
- X**
Xanthophylls, 15, 16, 17
- Z**
Zona pellucida 3, murine, 45
Zucchini yellow mosaic virus (ZYMV), 174



Index of Contributors

Altman, D. W., 106-114

Barry, G. F., 26-36
Beachy, R. N., 43-49
Benedict, J. H., 106-114
Bennett, S., 62-71
Bohnert, H. J., 115-125
Bramley, P. M., 13-19
Bright, S. W. J., 99-105

Carlton, B. C., 154-163
Carozzi, N. B., 164-171
Cramer, C. L., 62-71

Dawson, J., 164-171
Della-Cioppa, G., 57-61
Desai, N., 164-171
Dixon, R. A., 126-139
Drake, R., 13-19
Dunder, E., 164-171
Dunwell, J. M., 99-105

Ebskamp, M., 20-25
Evola, S. V., 164-171

Fitchen, J. H., 43-49

Golldack, D., 115-125
Grabau, E. A., 62-71
Grabowski, G. A., 62-71
Greenland, A. J., 99-105
Gressel, J., 140-153
Grill, L. K., 57-61

Halpin, C. M., 99-105
Hassan, E. A., 140-153
Hein, M. B., 43-49, 50-56, 72-81

Ishitani, M., 115-125

Jensen, R. G., 115-125

Kamasani, U. R., 115-125
Kishore, G. M., 26-36
Koziel, M. G., 164-171
Kridl, J. C., 1-12

Lamb, C. J., 126-139
Lassner, M., 82-90
Launis, K., 164-171

Ma, J. K-C., 72-81
Masoud, S., 126-139
Meeusen, R. L., 172-176
Metz, J., 82-90

Oishi, K. K., 62-71

Paiva, N. L., 126-139
Pen, J., 91-98
Pilon-Smits, L., 20-25
Ponce, E., 62-71
Ponstein, A. S., 91-98

Radin, D. N., 62-71
Rammesmayr, G., 115-125
Ransom, J. K., 140-153
Römer, S., 13-19

Sachs, E. S., 106-114
Schuch, W., 13-19, 99-105
Shen, B., 115-125
Sheveleva, E., 115-125
Shewmaker, C. K., 1-12
Smeekens, S., 20-25
Stark, D. M., 26-36
Sturtevant, A., 50-56
Sun, S. S. M., 37-42

Tu, H. M., 37-42

Verwoerd, T. C., 91-98

Wang, F., 50-56
Warren, G. W., 164-171
Weisbeek, P., 20-25
Weissenborn, D. L., 62-71

Xiong, L., 37-42

Yeo, T.-C., 50-56

Zuo, W., 37-42